

disclaimer thereby overcoming the rejection. Additionally, Applicant has cancelled claims 4 and 5.

Rejections Under 35 U.S.C. §112

The Examiner rejected Claims 1-12 under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly pointing out and distinctly claiming the subject matter which Applicant regards as the invention. Specifically, the Examiner indicated that certain recitations in Claims 1, 7, 8, 9, 11 and 12 lacked antecedent basis. Applicant respectfully submits that Applicant's amendment to such claims overcomes the rejection under 35 U.S.C. §112, second paragraph, and Applicant thanks the Examiner for pointing out the lack of antecedent basis in these instances.

Applicant has amended Claim 12 to delete "with or without other changes" and has therefore overcome the Examiner's rejection of Claim 12 under 35 U.S.C. §112. Applicant has also amended Claim 1 to change "head" to --heads--, and thereby, has overcome the Examiner's rejection with respect to 35 U.S.C. §112.

The Examiner rejected Claim 13 as being indefinite. Specifically, the Examiner stated that a claim is indefinite where it merely recites a use without an active, positive step delimiting how this use is actually practiced.

Applicant respectfully submits that Claim 13, as amended, is not reciting a use. Rather, Claim 13, as amended, is reciting acrylonitrile, methacrylonitrile or hydrogen cyanide made by the process of Claim 1. Applicant respectfully submits therefore that Claim 1 is not indefinite. It particularly points out and distinctly claims what Applicant regards as his invention.

Rejection Under 35 U.S.C. §101

The Examiner rejected Claim 13 under 35 U.S.C. §101 because the claimed recitation of a use, without setting forth any steps involved in the process results in an improper definition of a process.

Applicant has amended Claim 13 to delete "using" and substituted therefor --by--. Thus, Applicant is claiming the acrylonitrile, methacrylonitrile or hydrogen cyanide produced by the process of Claim 1. Applicant respectfully

submits that this amendment overcomes the Examiner's rejection because Applicant is not claiming a process in Claim 13. Rather, Applicant is claiming the acrylonitrile, methacrylonitrile or hydrogen cyanide made by the process of Claim 1.

Rejection Under 35 U.S.C. §103

The Examiner rejected Claims 1-12 under 35 U.S.C. §103(a) as being unpatentable over Wu '928 in view of Keckler et al.

Specifically, the Examiner stated that Wu discloses the process substantially as claimed. The Examiner made reference to col. 2, lines 37-55 in Wu. The Examiner stated that while not positively recited, Wu inhibits the formation of an aqueous phase above the feed tray of said heads column, as claimed so as to avoid the formation of polymeric HCN as suggested at col. 4, lines 7-20 of Keckler et al. The Examiner stated further that to combine Keckler et al. with Wu would have been obvious to one of ordinary skill in the art inasmuch as both references deal with the same processing environment.

As an initial matter, Applicant respectfully submits that Keckler et al. is not available as a reference against Applicant's claimed invention under 35 U.S.C. §103(a) in view of 35 U.S.C. §103(c). Keckler et al., names as an inventor Sanjay P. Godbole. The Keckler et al. patent, as noted on the patent itself, is assigned to The Standard Oil Company. The instant patent application, naming Sanjay P. Godbole, as the sole inventor, is also assigned to The Standard Oil Company. The subject matter of the Keckler et al. patent and the claimed invention were, at the time the invention of this patent application was made, owned by the same person, namely, The Standard Oil Company.

Nevertheless, even if the subject matter of the Keckler et al. patent was not subject to the exception of 35 U.S.C. §103(c), Applicant respectfully submits that Applicant's claimed invention set forth in Claims 1-12 is patentable over Wu in view of Keckler et al.

Specifically, Applicant respectfully submits that Wu does not disclose Applicant's claimed invention, neither in the passage referred to by the Examiner nor otherwise. The Examiner stated that Wu discloses the process substantially

as claimed. Applicant respectfully disagrees. Nowhere in the Wu patent is there, for example, any teaching or suggestion of operating a heads column in a manner which inhibits the formation of an aqueous phase above the feed tray of the heads column. While Keckler et al. at col. 3, lines 25-43 discloses that polymeric HCN forms in heads columns, there is no teaching or suggestion in Keckler et al. of operating the heads column in a manner which inhibits the formation of an aqueous phase above the feed tray. Thus, neither Wu nor Keckler et al., taken alone or taken separately, teaches or suggests Applicant's claimed invention, or make applicant's invention obvious under 35 U.S.C. §103(a).

The Examiner also rejected Claim 13 under 35 U.S.C. §102 as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over either Keckler or Wu.

Applicant respectfully submits that neither Keckler et al. nor Wu anticipates the invention of Claim 13. Claim 13 claims the acrylonitrile, methacrylonitrile or hydrogen cyanide made by the process of Claim 1. Neither Keckler et al. nor Wu teaches all the claim elements of Claim 1. Therefore, neither of these patents anticipates the invention of Claim 13. Also, for the reasons presented above, Keckler et al. is not available as a reference due to 35 U.S.C. §103(c) and, neither Keckler et al. nor Wu, taken alone or in combination renders the invention of Claim 1 obvious. Consequently, the acrylonitrile, methacrylonitrile and the hydrogen cyanide made by the process of Claim 1 is also not obvious in view of the Keckler et al. and Wu patents.

In view of the above, Applicant respectfully requests reconsideration of the rejections under 35 U.S.C. §101, 103(a) and 112, second paragraph, and the rejection for obviousness-type double patenting.

Applicant respectfully submits that Applicant has claimed patentable subject matter and Applicant respectfully request that instant application be passed for allowance.

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Marked-Up Version of Amended Claims

Please amend the specification as follows:

Please replace the last paragraph beginning on page 5 with the following:

--Additional objects, advantages and novel features of the invention will be set forth in part in the description which follows, and in part, will become apparent to those skilled in the art upon examination of the following or may be learned by the practice of the invention. The objects and advantages of the invention may be realized and obtained by means of the instrumentalities and combinations particularly pointed out in the appended claims. To achieve the foregoing and other objects and in accordance with the purpose of the present invention as embodied and broadly described herein, the process of the present invention comprises transporting the reactor effluent obtained during the ammonoxidation of propane, propylene or isobutylene to a quench column wherein the hot effluent gases are cooled by contact with an aqueous spray, passing the cooled reactor effluent overhead to an absorber column wherein the HCN and crude acrylonitrile or methacrylonitrile is absorbed in water, passing the aqueous solution containing the HCN and acrylonitrile or methacrylonitrile, plus other impurities to a first distillation column (recovery column), where a significant portion of the water and impurities are removed as a liquid bottoms product, while HCN, water, a minor portion of impurities and acrylonitrile or methacrylonitrile are removed as an overhead vapor stream. This overhead vapor stream is further cooled using a heat exchanger, and directed to [adecanter] a decanter, to separate and [condensed] condense liquids which are returned to the recovery process, while the remaining vapor stream is directed to a flare, incinerator, or other disposal process. The organic stream is fed to the heads column for separation of HCN from acrylonitrile.

Please replace the last paragraph beginning on page 7 with the following:

The general recovery and purification of acrylonitrile or methacrylonitrile, and the present invention will now be described in detail with reference to Figure 1. The reactor effluent 11 obtained by the ammonoxidation of propane, propylene

or isobutylene, ammonia and oxygen containing gas in a fluid bed reactor (not shown) while in contact with a fluid bed ammonoxidation catalyst is transported to a quench column 10 via transfer line 11, wherein the hot effluent gases are cooled by contact with water spray 14. The cooled effluent gas containing the desired product (acrylonitrile or methacrylonitrile, acetonitrile and HCN) is then passed into the bottom of an absorber column 20 via line 12 wherein the products are absorbed in water which enters absorber column 20 from the top via line 24. The non-absorbed gases pass from the absorber through pipe 22 located at the top of the absorber 20. The aqueous stream containing the desired product is then passed via line 23 from the bottom of absorber 20 to the upper portion of a first distillation column 30 (recovery column) for further product purification. The product is recovered from the top portion of recovery column 30 and sent to a second distillation column 40 (heads column) 40 via line 32, while water and other impurities are removed from the recovery column 30 via line 33. In the heads column 40, the HCN is taken overhead and removed from the column via line 42, cooled in overhead condenser 80, and the resulting material directed to reflux drum 50 via line [41] 51. Liquid reflux from the reflux drum 50 is returned to the upper portion of the heads tower via line 53. Vapor phase material is removed from the reflux drum 50 via line 52 and cooled in HCN product condenser 90. Optional intermediate condenser 60 can be added to heads column 40. Material is withdrawn from column 40 above feedline 32 by line 61, cooled, and returned to the heads column 40 by line 62. Optional decanter 70 can be added to heads column 40. Side material is withdrawn from column 40 by line 71 and the organic phase is returned by line 72.

In the Claims:

Kindly cancel Claims 3-5.

Please amend Claims 1, 7, 8, 9, 11, 12 and 13 as follows:

1. (Once Amended) A process for the recovery of acrylonitrile, methacrylonitrile or hydrogen cyanide obtained from the reactor effluent of an ammonoxidation reaction of propane, propylene or isobutylene comprising passing said reactor effluent through an absorber column, a recovery column and a

heads column comprising a feed tray wherein the improvement comprises operating said [head] heads column in a manner which inhibits the formation of an aqueous phase above the feed tray of said heads column.

7. (Once Amended) The process of claim 1, wherein said heads column comprises stripping trays and wherein said operating manner of said heads column comprises increasing the number of stripping trays of said head column.

8. (Once Amended) The process of claim 1, wherein said heads column comprises a reboiler with a reboiler duty and wherein said operating manner of said heads column comprises increasing the reboiler duty of said heads column.

9. (Once Amended) The process of claim 1, wherein said heads column comprises a reflux condenser and wherein said operating manner of said heads column comprises using an intermediate condenser above the feed tray of said heads column and below the reflux condenser of said heads column.

11. (Once Amended) The process of claim 1, wherein said heads column comprises a reflux condenser and a reflux stream and wherein said operating manner of said heads column comprises subcooling the reflux stream to said heads column.

12. (Once Amended) The process of claim 1, wherein said operating manner of said heads column comprises reducing operating pressure of said heads column [with or without other changes] so that the [second] aqueous liquid phase [region] is reduced with pressure reduction [as well].

13. (Once Amended) Acrylonitrile, methacrylonitrile or hydrogen cyanide produced [using] by the process of claim 1.